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EXAMINER
RUSH, ERIC

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/576,498	HAMANAKA, MASAHIKO	
	Examiner	Art Unit	
	ERIC RUSH	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 29 April 2009 has been entered.

Claim Objections

2. The objection to claim 23 is hereby withdrawn in view of the amendments and remarks received 29 April 2009.

3. Claim 9 is objected to because of the following informalities: Claim 9 depends from claim 4, now cancelled, The Examiner will treat claim 9 as being dependent upon claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because it is unclear to how the comparison image is selected. In lines 13 - 15 of claim 1 it says, "... selecting, as the comparison image close to the reference image, the comparison image having the smallest minimum distance" then in line 20 of claim 1 it refers back to "the generated comparison *images"* and finally in lines 26 - 31 of claim 1 the image comparing means "identifies whether a match exists between any of the generated comparison images and of the reference image. It is unclear as to how many comparison images are passed from the "comparison image generating means", lines 7 - 15, to the remaining elements of the claim since it appears as though in lines 13 - 15 that only one comparison image is selected.

7. Claims 2 - 3 and 5 - 9 are also rejected under 35 U.S.C. 112, second paragraph, as being indefinite as being dependent upon a rejected base claim.

8. Claims 10 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Claims 10 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite because reasons analogous to the 35 U.S.C. 112, second paragraph, rejection of claim 1 above.

10. Claims 11 - 18 and 20 - 27 are also rejected under 35 U.S.C. 112, second paragraph, as being indefinite as being dependent upon a rejected base claim.

Claim Rejections - 35 USC § 103

11. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

12. Claims 1-3, 7-13, 16-22 and 25- 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dionysian U.S. Patent No. 6,002,782 in view of Kawakami et al. U.S. Publication No. 2001/0020946 A1.

- With regards to claims 1, 10, and 19, as best understood by the Examiner, Dionysian teaches an image comparison system, method and program comprising: means for inputting three-dimensional data of an object; (Dionysian, Figure 1, Column 3 Lines 20 - 35) reference image storing means for storing a reference image of at least one reference object; (Dionysian, Column 4 Lines 22 – 26) pose candidate deciding means for generating a pose candidate; (Dionysian, Column 4 Lines 29 - 58, Dionysian teaches transforming the three-dimensional model in order to coincide the model with the viewing direction of the access image) comparison image generating means for generating, for the reference image for the at least one object, a comparison image close to the reference image, said generating including projecting

the three-dimensional data onto a two-dimensional image in accordance with each of the plurality of pose candidates to generate a plurality of comparison images and calculating, for each of the plurality of comparison images, the minimum distance between the comparison image and the reference image and selecting, as the comparison image close to the reference image, the comparison image having the smallest minimum distance; (Dionysian, Column 6 Lines 5 - 27) image comparing means for determining one of a minimum distance value and a maximum similarity degree between the reference image and the generated comparison images; (Dionysian, Column 6 Lines 28 - 58), wherein the image comparing means performs a comparison between the reference image and each of the generated comparison images on the basis of one of the minimum distance value and the maximum similarity degree corrected by the correcting means and, based on a result of the comparison, identifies whether a match exists between any of the generated comparison images and of the reference image. (Dionysian, Column 6 Lines 28 - 58, Dionysian teaches verifying a match if a correlation value exceeds a threshold but fails to teach wherein the correlation value is corrected. Kawakami et al. teach a correcting means for correcting one of the minimum distance value and the maximum similarity degree determined by the image comparing means, ex. correcting a

similarity degree (correlation value), and the combined teachings of Dionysian in view of Kawakami et al. teach and suggest the image comparing means of Dionysian comparing images with corrected similarity values.) Dionysian fails to explicitly teach generating a plurality of pose candidates; reference correction coefficient storing means for storing a correction coefficient corresponding to the reference image; correcting means for correcting, based on the correction coefficient, one of the minimum distance value and the maximum similarity degree determined by the image comparing means. Kawakami et al. teach generating a plurality of pose candidates; (Kawakami et al., Page 5 Paragraphs 0073 - 0077 and Page 6 Paragraphs 0084 - 0087) reference correction coefficient storing means for storing a correction coefficient corresponding to the reference image; (Kawakami et al., Fig. 1, Page 6 Paragraphs 0080 - 0087) correcting means for correcting, based on the correction coefficient, one of the minimum distance value and the maximum similarity degree determined by the image comparing means. (Kawakami et al., Page 6 Paragraphs 0080 – 0087) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Dionysian with the teachings of Kawakami et al. This modification would have been prompted because Dionysian teaches a substantially similar approach to solving the same problem as Kawakami et al. but

merely fails to use an iterative approach. One would have been motivated to make such a modification in order to increase the accuracy of the system because of the increased ability to adjust the pose of the comparison image to the most accurate representation by using the iterative approach for reducing the misalignment. Furthermore, the modification of correcting the would have been prompted in order to account for variations in various conditions between the reference and comparison images, by being able to correct/alter comparison parameters as disclosed by Kawakami et al.

- With regards to claims 2, 11, and 20, as best understood by the Examiner, Dionysian in view of Kawakami et al. teach an image comparison system, method and program according to claims 1, 10, and 19, respectively, characterized in that said image comparing means comprises: calculating means for calculating one of the distance value and the similarity degree between the reference image and the comparison image; (Dionysian, Column 6 Lines 23 – 67, a correlation value is obtained, i.e. similarity degree) selecting means for selecting one of a minimum distance value which is a smallest distance value and a maximum similarity degree which is a largest similarity degree; (Dionysian, Column 6 Lines 23 – 67 and Column 7 Line 64 - Column 8 Line 4) and comparing

means for performing comparison on the basis of one of a result of comparison between the minimum distance value and a threshold value and a result of comparison between the maximum similarity degree and a threshold value. (Dionysian, Column 6 Lines 23 – 67, the correlation value must exceed a threshold)

- With regards to claims 3, 12, and 21, as best understood by the Examiner, Dionysian in view of Kawakami et al. teach an image comparison system, method and program according to claims 1, 10, and 19, respectively, characterized in that said comparison image generating means generates a comparison image close to each reference image, (Dionysian, Column 6 Lines 5 - 27) and said image comparing means comprises: calculating means for calculating one of a distance value and a similarity degree between each reference image and the comparison image; (Dionysian, Column 6 Lines 23 – 67 and Column 7 Line 64 - Column 8 Line 4) selecting means for selecting one of a minimum distance value which is a smallest distance value and a maximum similarity degree which is a largest similarity degree for each reference image; (Dionysian, Column 6 Lines 23 – 67 and Column 7 Line 64 - Column 8 Line 4) and comparing means for outputting, as a comparison result, one of a reference image including a smallest minimum distance value which is a smallest one of minimum

distance values and a reference image including a largest maximum similarity degree which is a largest one of maximum similarity degrees. (Dionysian, Column 6 Lines 23 – 67)

- With regards to claims 13 and 22, as best understood by the Examiner, Dionysian in view of Kawakami et al. teach an image comparison method and program according to claims 10, and 19, respectively. Dionysian fails to teach a method and program further characterized by further comprising: correcting means for correcting one of the minimum distance value and the maximum similarity degree by using the correction coefficient. Kawakami et al. teach a method and program further characterized by further comprising: correcting means for correcting one of the minimum distance value and the maximum similarity degree by using the correction coefficient. (Kawakami et al., Page 6 Paragraphs 0080 – 0087) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teachings of Dionysian in view of Kawakami et al. with further teachings of Kawakami et al. This modification would have been prompted in order to account for variations in various conditions between the reference and comparison images.

- With regards to claims 7, 16, and 25, as best understood by the Examiner, Dionysian in view of Kawakami et al. teach an image comparison system, method and program according to claims 1, 10, and 19, respectively. Dionysian fails to teach a system, method and program characterized by further comprising: representative three-dimensional object model storing means for storing representative ones of three-dimensional object models as representative three-dimensional object models; group storing means for storing related information of the representative three-dimensional object models and reference images; three-dimensional comparing means for comparing the input three-dimensional data with the representative three-dimensional object models, and selecting a representative three-dimensional object model similar to the three-dimensional data; and reference image selecting means for selecting a reference image corresponding to the selected representative three-dimensional object model by referring to the related information, wherein said image comparing means compares the selected reference image with the input three-dimensional data. Kawakami et al. teach a system, method and program characterized by further comprising: representative three-dimensional object model storing means for storing representative ones of three-dimensional object models as representative three-dimensional object models; (Kawakami et al., Page 2 Paragraph

0033) group storing means for storing related information of the representative three-dimensional object models and reference images; (Kawakami et al., Page 2 Paragraph 0033, Page 3 Paragraphs 0045 - 0048) three-dimensional comparing means for comparing the input three-dimensional data with the representative three-dimensional object models, (Kawakami et al., Page 3 Paragraphs 0040 - 0042) and selecting a representative three-dimensional object model similar to the three-dimensional data; (Kawakami et al., Page 3 Paragraphs 0040 - 0042) and reference image selecting means for selecting a reference image corresponding to the selected representative three-dimensional object model by referring to the related information, (Kawakami et al., Page 3 Paragraphs 0040 - 0042) wherein said image comparing means compares the selected reference image with the input three-dimensional data. (Kawakami et al., Fig. 1, Page 2 Paragraph 0033, Page 3 Paragraphs 0045 - 0048) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teachings of Dionysian in view of Kawakami et al. with further teachings of Kawakami et al. This modification would have been prompted in order to more accurately compare reference data with inputted data of the same orientation whilst taking into account numerous variations between the two inputs.

- With regards to claims 8, 17, and 26, as best understood by the Examiner, Dionysian in view of Kawakami et al. teach an image comparison system, method and program according to claims 1, 10, and 19, respectively. Dionysian fails to teach a system, method and program characterized by further comprising: representative image storing means for storing representative ones of images as representative images; group storing means for storing related information of the representative images and reference images; representative image selecting means for comparing the input three-dimensional data with the representative images, and selecting a representative image similar to the three-dimensional data; and reference image selecting means for selecting a reference image corresponding to the selected representative image by referring to the related information, wherein said image comparing means compares the selected reference image with the input three-dimensional data. Kawakami et al. teach a system, method and program characterized by further comprising: representative image storing means for storing representative ones of images as representative images; (Kawakami et al., Fig. 1, Page 3 Paragraphs 0041 - 0045) group storing means for storing related information of the representative images and reference images; (Kawakami et al., Page 3 Paragraphs 0046 - 0048) representative

image selecting means for comparing the input three-dimensional data with the representative images, (Kawakami et al., Page 7 Paragraphs 0102 -0103) and selecting a representative image similar to the three-dimensional data; (Kawakami et al., Page 7 Paragraphs 0102 - 0103) and reference image selecting means for selecting a reference image corresponding to the selected representative image by referring to the related information, (Kawakami et al., Fig. 1, Page 2 Paragraph 0033, Page 3 Paragraphs 0040 - 0048) wherein said image comparing means compares the selected reference image with the input three-dimensional data. (Kawakami et al., Page 7 Paragraphs 0102 - 0103) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teachings of Dionysian in view of Kawakami et al. with further teachings of Kawakami et al. This modification would have been prompted in order to more accurately compare reference data with inputted data of the same orientation whilst taking into account numerous variations between the two inputs.

- With regards to claims 9, 18 and 27, as best understood by the Examiner, Dionysian in view of Kawakami et al. teach an image comparison system, method and program according to claims 4, 13, and 22, respectively. Dionysian fails to teach a system, method

and program characterized in that the correction coefficient is determined on the basis of at least one of a distance value and a similarity degree between a representative three-dimensional object model and the reference image. Kawakami et al. teach a system, method and program characterized in that the correction coefficient is determined on the basis of at least one of a distance value and a similarity degree between a representative three-dimensional object model and the reference image. (Kawakami et al., Page 6 Paragraphs 0080 - 0087)

13. Claims 5-6, 14-15, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dionysian U.S. Patent No. 6,002,782 in view of Kawakami et al. U.S. Publication No. 2001-0020946 A1 as applied to claims 1, 10, 19 above, and further in view of Roy et al. U.S. Patent No. 6,956,569.

- With regards to claims 5, 14, and 23, as best understood by the Examiner, Dionysian in view of Kawakami et al. teach an image comparison system, method and program according to claims 1, 10, and 19, respectively. Dionysian fails to teach a system, method and program further characterized by further comprising reference weighting coefficient storing means for storing a weighting coefficient corresponding to the reference image, said image comparing means comprising calculating means for calculating one

of the distance value and the similarity degree between the reference image and the comparison image by using the weighting coefficient corresponding to the reference image. Roy et al. teach a system, method and program further characterized by further comprising reference weighting coefficient storing means for storing a weighting coefficient corresponding to the reference image, (Roy et al., Column 6 Lines 5 – 26 and Lines 34—60, Column 9 Line 64 – Column 10 Line 58) said image comparing means comprising calculating means for calculating one of the distance value and the similarity degree between the reference image and the comparison image by using the weighting coefficient corresponding to the reference image. (Roy et al., Column 10 Line 41 – Column 11 Line 12) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teachings of Dionysian in view of Kawakami et al. with the teachings of Roy et al. This modification would have been prompted in order to account for variations in lighting conditions between the reference and comparison images.

- With regards to claims 6, 15, and 24, as best understood by the Examiner, Dionysian in view of Kawakami et al. teach an image comparison system, and program according to claims 1, 10, and 19, respectively. Dionysian fails to teach a system, method and

program characterized by further comprising: extracting a three-dimensional reference point from the input three-dimensional data; and obtaining a coordinate correspondence of a standard three-dimensional weighting coefficient to the three-dimensional data by using a standard three-dimensional reference point corresponding to a standard three-dimensional object model and the three-dimensional reference point of the three-dimensional data, and converting the standard three-dimensional weighting coefficient into a two-dimensional weighting coefficient in accordance with the pose candidate, the step of performing comparison comprising the step of calculating one of the distance value and the similarity degree between the reference image and the comparison image by using the converted two-dimensional weighting coefficient. Roy et al. teach a system, method and program characterized by further comprising: extracting a three-dimensional reference point from the input three-dimensional data; (Roy et al., Column 12 Line 27 – Column 13 Line 12) and obtaining a coordinate correspondence of a standard three-dimensional weighting coefficient to the three-dimensional data by using a standard three-dimensional reference point corresponding to a standard three-dimensional object model and the three-dimensional reference point of the three-dimensional data, (Roy et al., Column 12 Line 27 – Column 13 Line 12) and converting the standard three-dimensional weighting coefficient into

a two-dimensional weighting coefficient in accordance with the pose candidate, (Roy et al., Column 11 Lines 42 – 52, Column 12 Line 58 – Column 14 Line 7) the step of performing comparison comprising the step of calculating one of the distance value and the similarity degree between the reference image and the comparison image by using the converted two-dimensional weighting coefficient. (Roy et al., Column 10 Line 34 – Column 11 Line 12) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teachings of Dionysian in view of Kawakami et al. with the teachings of Roy et al. The modification would have been prompted in order to accurately map 3D correcting coefficients to the coefficients needed to correct the corresponding 2D image.

Response to Arguments

14. Applicant's arguments filed 29 April 2009 have been fully considered but they are not persuasive. On page 16 of the remarks filed 29 April 2009 the Applicant's Representative argues that Dionysian fails to teach generating a plurality of pose candidates. The Examiner agrees but asserts that Dionysian teach generating a pose candidate image and Kawakami et al. is relied upon to teach generating a plurality of pose candidates, because Kawakami et al. disclose repeatedly correcting a plurality of parameters including pose parameters.

15. On page 16 of the remarks filed 29 April 2009 the Applicant's Representative argues that Kawakami et al. fail to teach correcting *either* a minimum distance value or a maximum similarity degree because Kawakami et al. repeatedly correct all available parameters. The Examiner respectfully disagrees and asserts that the limitation of correcting *either* a minimum distance value or a maximum similarity degree is not recited in the claims. The claims recited correcting *one of* a minimum distance value or a maximum similarity degree. Furthermore the Examiner asserts that the claims are directed to a system, method and computer readable storage medium *comprising.* The transitional phrase "comprising" does not preclude additional steps/elements.

16. On page 17 of the remarks filed 29 April 2009 the Applicant's Representative argues that "the correction coefficient is determined and stored specifically for a reference image *before* executing a comparing process". In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the correction coefficient is determined and stored specifically for a reference image *before* executing a comparing process) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

17. On page 17 of the remarks filed 29 April 2009 the Applicant's Representative argues that Roy et al. fail to teach or suggest using a weighting coefficient that corresponds to a reference image. The Examiner respectfully

disagrees and asserts that Roy et al. in fact teach a weighting coefficient. Roy et al. teach, in Column 11 Lines 4 - 12, that a weighted sum of variances is used to derive an error measure, their yardstick of comparison, and the model with the best error measure is selected and outputted as the best match to the query image. The weighting of Roy et al. is described in Column 9 Line 67 - Column 10 Line 17. The Examiner asserts that Roy et al. use a weighting coefficient corresponding to the reference image for comparing the images.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC RUSH whose telephone number is (571)270-3017. The examiner can normally be reached on 7:30AM - 5:00PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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